QuEChERS Technologies for Detection of Threats to the Food Supply

Protecting the Nation's Food Supply

The introduction of hazardous substances into the food supply, whether accidental or intentional, presents a threat to human health. To reduce the incidence of food-borne illness and increase the efficacy of food safety systems, a risk-based approach must be used to define critical control points in the supply, processing and distribution chains to effectively implement new technologies that prevent, detect, identify or control toxins, microbial pathogen introduction or contamination. Further, improved analytical techniques are needed to identify specific pathogens in the food supply so that preventive and corrective actions can be taken.

Risk Evaluation

Researchers at the University of Kentucky are developing a risk-based approach that will be used to decrease the probability of introduction of chemical or biological toxin contaminants into the food supply by analyzing and assessing vulnerabilities in two food model systems. A systematic application and iterative development of these models will aid in establishing critical control points in the food supply processing and distribution chains, with the ultimate goal of implementing analytical technologies to prevent and/or detect toxin contamination

Detecting Threats

Improved analytical methods that enhance and validate the detection of chemical or biological threats to the US food supply are needed. QuEChERS is an extraction method that was developed and is used by USDA-ARS to extract and isolate chemicals from food samples. These chemicals (threats) can be added directly to the food, or they can be produced in the food. Further QuEChERS development is required to expand this method's current capabilities to accommodate additional threats and to be of more use to first responders. The goal is to provide QuEChERS kits for use by responders.

Path Forward

To perform the risk evaluation, Red Teams and Blue Teams comprising representatives from academia and the USDA have been formed to propose and defend against potential terrorist attacks that could be used to contaminate portions of the US food supply. Four credible scenarios have been developed and are being evaluated in the Red/Blue team gaming environment. Further, meetings with first responders are now being conducted to ensure that proposed defensive strategies are realizable in actual response situations. This exercise will identify the most vulnerable links in the food supply chain that need to be protected.
This will allow the response forces to optimize the configuration and selection of QuEChERS kits so that pathogens can be quickly and accurately detected and mitigated.

To learn more about this project, contact: Mike Matthews, Program Manager, at mike.matthews@dhs.gov or Ewell Balltrip, NIHS, CEO at eballtrip@thenihs.org 2014-07-23.1pager